

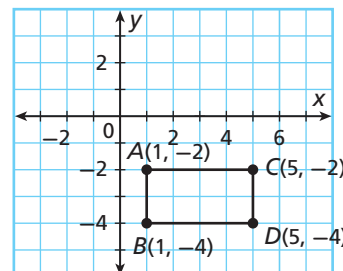
LESSON

7-2 Similarity and Transformations

1. Apply the dilation D to the polygon with the given vertices. Name the coordinates of the image points. Identify and describe the transformation.

$$D: (x, y) \rightarrow (0.5x, 0.5y)$$

$$A(1, -2), B(1, -4), C(5, -2), D(5, -4)$$



Determine whether the polygons with the given vertices are similar. Support your answer by describing a transformation.

2.

$$V(3, 2), W(8, 2), X(1, 5)$$

$$R(6, 4), S(16, 4), T(3, 15)$$

3.

$$A(-2, -3), B(-2, 0), C(10, -3)$$

$$P(-4, 2), Q(-4, 4), R(4, 2)$$



4. Triangle ABC is dilated by a scale factor of 5. The image is A'B'C'.

Compare the angle measures and side lengths of the original triangle and its image after dilation.

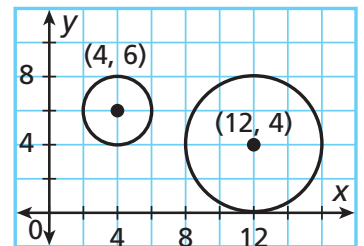


/// ERROR ANALYSIS /// 5. Triangle ABC has vertices at A(-12, -6), B(-6, 12), and C(6, 12). The images of A and B after the similarity transformation D are A'(-8, -4) and B'(-4, 8). Reggie and Hillary find different coordinates for C', the image of C. Their work is shown below. Who made an error? Describe the error.

Hillary's Work	
$C' : (6, 12) \rightarrow \left(\frac{2}{3} \cdot 6, \frac{2}{3} \cdot 12\right)$	
$\rightarrow (4, 8)$	

Reggie's Work	
$C' : (6, 12) \rightarrow \left(\frac{3}{2} \cdot 6, \frac{3}{2} \cdot 12\right)$	
$\rightarrow (9, 18)$	

6. A baby pool with radius 2 meters is being built near a larger pool with radius 4 meters at a recreation center. The plans for the construction are laid out on the coordinate system shown. Prove that the baby pool is similar to the larger pool.



7. An architect is making a scale drawing of two buildings whose floor plans are to be similar rectangles. He has already drawn the smaller building. The larger building will be located to the upper right and will have dimensions 5 times those of the smaller building. How can he draw the larger building?

8. To map a figure A to a similar figure B, first A is mapped to A' by a dilation: $(x, y) \rightarrow \left(\frac{5}{3}x, \frac{5}{3}y\right)$. Then A' is mapped to B by a translation $(x, y) \rightarrow (x - 2, y + 1)$. The vertices of A' are W(-10, 0), X(-5, 10), Y(5, 10), and Z(-5, 0). Find the vertices of A and B.

9. _____ Triangle ABC undergoes a transformation T to produce the image EFG. Given the vertices of the triangles below, which is a true statement about T?

A(4, 8), B(0, 4), C(4, 0)
E(3, 6), F(0, 3), G(3, 0)

A. T is a similarity transformation in which ABC is dilated by a scale factor of $\frac{3}{4}$.

B. T is a congruence transformation in which ABC is dilated by a scale factor of $\frac{3}{4}$.

C. T is a similarity transformation in which ABC is dilated by a scale factor of $\frac{4}{3}$.

D. T is a congruence transformation in which ABC is dilated by a scale factor of $\frac{4}{3}$.

10. _____ Figure ABCD with the vertices given below is translated 6 units left and 7 units down. It is then dilated to produce the similar figure EFGH with the vertices given below. By what scale is the figure dilated?

A(10, 15), B(14, 7), C(6, 7), D(6, 11)
E(5, 10), F(10, 0), G(0, 0), H(0, 5)

A. 0.5

B. 0.8

C. 1.25

D. 1.5

11. The area of a square is 16 square units and its lower left vertex is positioned at $(2, 0)$. After a similarity transformation, the image of the lower left vertex is positioned at $(-8, 0)$. Name the other three vertices of the image and find its area.

12. The hypotenuse of a right triangle ABC in a coordinate plane is \overline{AB} , with A at $(1, 2)$ and B at $(3, 6)$. The image of the hypotenuse after a rotation of 180° and a dilation is $\overline{A'B'}$, with A' at $(-3.5, -7)$ and B' at $(-10.5, -21)$. Give two possible locations of C' , the image of C .

